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RECENT ALTERATIONS IN RANGE AND ABUNDANCE OF MARINE INVERTEBRATES IN SOUTH AUSTRALIA

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During the last twenty years there has been a noticeable increase in the number of certain species of invertebrates, notably Molluses, living on South Australian beaches. This has been particularly observed in Gulf St. Vincent, where regular collecting is conducted by many enthusiasts. Some species of Molluses taken previously only on open ocean beaches now inhabit Gulf St. Vincent.

The present paper discusses some of the species which have shown a notable change in status, either in distribution or numerical abundance, in recent years.

MOLLUSCA PELECYPODA

1. *Anadara trapezia* (Deshayes)

The recent discovery of living *Anadara trapezia* at Oyster Harbour, Western Australia (Kendrick and Wilson, 1959) may be an example of the phenomena now being discussed. Besides South-Western Australia this bivalve lives at Phillip Island, Western Port Bay, Victoria, with the common *Katelysia*, a species plentiful at the Outer Harbour, S.A. It is found in vast quantities as a sub-fossil on the stranded beaches (of the 20 ft. level) in South Australia and attains to a large size. Many are *in situ* with joined valves and appear to have been wiped out suddenly, one would say catastrophically. There is every reason to suppose that if reintroduced into suitable S.A. territory the species might flourish again.

On September 25, 1956, a parcel of some two dozen *Anadara trapezia* were collected at my request by Mr. R. J. Plant at Rhyll, Phillip Island, which is the southernmost point where the species thrives. Through the organization of Mr. D. I. Hartley, President of the Malacological Society of Australia, the shells were delivered alive in Adelaide by air 23 hours later in good condition. With the approval of the Director of Fisheries the coekles were placed in the sea from the extreme end of the jetty at Largs, on the day of their arrival, September 26.

In April 1960, Mr. R. C. Edwardes brought in a fresh valve two inches long, picked up just south of the breakwater at the

Outer Harbour. This is the point at which objects are washed up by the prevailing south-westerlies from the locality in which the specimens were placed. No living cockles have been seen as yet.

2. *Parviperna nucleus* (Lamarck)

I first recorded this species as *Isognomon spathulata* Reeve in 1930, from a living shell from St. Francis Island, and later, after taking a specimen at Levens, Yorke Peninsula, concluded that it should be renamed. Iredale (1939) wrote: "apparently the first note of one of these small shells is that of Lamarck who names *Perna nucleus* (*Hist. Anim. S. Vert.*, 6 (1), p. 142, July 1819) with a length of 16 mm., and as 'Habite a l'ile S. Pierre-S. Francois de la Nouvelle Hollande. Peron et Le Sueur.' The colour is not given and the locality does not furnish such a shell as has been traditionally known under Lamarck's names. Then Gould (*Proc. Bost. Soc. Nat. Hist.*, 3, p. 312, December 1850) introduced *Perna nana*, a little black shell from Fiji, and this has been regarded as Lamarck's species." The species under consideration, however, is certainly a South Australian shell. *Pedalion franciscensis* was named by me from the type locality of Lamarck's *P. nucleus* and the latter name may be the correct one for the South Australian shell. This tropical shell is either re-established or extremely rare.

3. *Ostrea sinuata* (Lamarck)

Forty years ago the "Port Lincoln Oyster" was sold for food in South Australian shops alongside the Sydney Rock Oyster (*Crassostrea commercialis* Iredale). It was evidently becoming very scarce about this time and specimens were seldom found on local beaches. The same applied to the population of this oyster on our eastern coasts. After a strong wind it is now possible to collect some few dozen specimens at places such as Henley, Grange, Semaphore, Largs, and enjoy an attractive repast (Cotton, 1955). There seems to be a general increase in the "Port Lincoln" or "Mud Oyster" population around the Australian coast. An increase of the quantity of fresh water running into the sea, carrying microscopic food, is said to be the reason. In S.A. the more frequent and more severe storms washing the shells from the natural beds has been mentioned as an additional cause of their being taken.

4. *Crassostrea australis* (Lamarck)

This oyster, a Western Australian species, has made its presence noticed in South Australia within recent years (Cotton, 1950).

5. *Crassostrea scyphophilla* (Peron)

Mr. Edgar Mundy, of Port Lincoln, has large and typical specimens of the species taken at "Franklin Harbour, Cowell, in creek, left hand side, just in entrance 1910." Mr. Mundy writes that the "Mangrove Oyster" was plentiful in those days at Cowell, Shoal Water Point and Port Augusta. A specimen sent by him of the original series to F. L. Saunders, Adelaide, measures 80 mm. in length and the aperture of the "horn" is 40 mm. in diameter. The

shell has a dark violet coloration externally and on the inner margin somewhat like that of *Crassostrea australis*. *C. scyphophilla* appears to be extinct in S.A. nowadays.

This mangrove-living oyster is an example of a tropical species, living in North-Western Australia, which has apparently crept southwards into South-Western Australia and could re-establish itself in S.A. if the west-east current were to wash larvae into such places where the mangroves still flourish.

6. *Notochlamys hallae* Cotton

Specimens of this two inch scallop were found alive at Largs in 1959. Over half a century of careful collecting had failed to find this distinctive species. It can only be presumed that it has recently appeared here or is now in sufficient quantity to be noticed from the few specimens found. Known species putting in a first appearance in South Australia usually prove to be from Western Australia. *N. hallae*, however, is quite a new species and is only known from the type locality.

7. *Phragmorisma watsoni* (Smith)

The species was described in *The Voyage of H.M.S. Challenger, Zoology*, vol. 13, p. 69, pl. 6, fig. 5-5b, as taken in Bass Strait, 38-40 fathoms, and fragmentary specimens have been recorded from Twofold Bay, N.S.W., 15-25 fathoms. It was not taken in the Vereo dredgings between 1895 and 1918, nor have any fragments been seen from the Flindersian Region until 1957 (Cotton 1957 b).

That year David Howlett took a perfect typical living specimen in 14 fathoms off St. Francis Island, South Australia. A photograph of the unique specimen in the Howlett collection is to be reproduced in the current publication of *South Australian Mollusca. Pelecypoda*, Government Printer, Adelaide (now in press).

Thracia watsoni is the type species of *Phragmorisma* Tate, 1893, and belongs to the family Myoelamidae. The species *P. antinaeformis* Tate, 1893, described from the Eocene, Spring Creek, Geelong (holotype) and Yabee Cape, Tasmania, is a Tertiary fossil closely allied to the Recent species.

8. *Vasticardium flavum* (Linne)

This Western Australian species was rarely taken alive in South Australia in the past, but specimens now live around Eyre Peninsula. I wrote in 1938: "Appears to have died out in South Australia, all the specimens we have seen are dead shells and probably subfossil."

9. *Callanaitis disjecta* (Perry)

The nearest point to Adelaide beaches whence this shell formerly came was American River, Kangaroo Island, but by 1940 specimens were taken alive as far north as Glenelg. The population increased rapidly in that area, extending by 1950 as far north as Largs. In June 1960, Trevor Smith took 135 specimens in two

days at Semaphore. A total of over 200 were known to be taken by collectors in the same area.

10. *Periglypta puerpera* (Linne)

This species was originally recorded from "Swan River," South-Western Australia. Only one old shell in the S.A. Museum collection has the label "S.A." J. Veitch dredged a living specimen at Spalding Bay, Port Lincoln, in 1945, measuring 70 mm. x 65 mm. (Cotton, 1950). This added another tropical species to the S.A. list.

11. *Panopea australis* (Sowerby)

A few odd dead valves of this species have been taken in S.A. over the last 50 years. J. Veitch, of Port Lincoln, took it alive in February 1951 at Cape Donnington, 7-8 fathoms, and also a dead valve at Boston Island (Veitch Collection). This is well to the west of previous records and the species is not recorded from Western Australia.

CEPHALOPODA

12. *Argonauta nodosa* Solander

In 1948 I wrote: "These shells were once very rare on the local Adclaide beaches, but during the last five years some specimens have been taken" (Cotton, 1948). On August 21, 1943, six were reported washed ashore on different local beaches between Outer Harbour and Brighton and another with eggs was taken on August 8 by Dr. Angas Johnson at Port Noarlunga (Cotton, 1943).

The largest specimen seen in South Australia, 10½ in. in diameter, was taken at Henley Beach and is on show in the S.A. Museum collection. A correspondingly greater number are also being washed ashore on southern Yorke Peninsula.

13. *Nautilus repertus* Iredale

This Pearly Nautilus was recorded alive in South Australia at Foul Bay, Southern Yorke Peninsula (Cotton, 1957).

GASTROPODA

14. *Austrocypraea reevei* (Sowerby)

This Western Australian species was once regarded as rare in S.A., odd specimens being taken as far east as the west coast of Yorke Peninsula, but not further east. In 1956 half a dozen collectors are said, by the Secretary of the Malacological Section of the Royal Society of South Australia, to have taken a total of about 80 specimens (some living) in one weekend at Normanville.

15. *Zoila thersites* (Gaskoin)

The Black Cowrie occurs in quantity around Eyre Peninsula and Yorke Peninsula. A collector is said, by Mr. P. Tremberth, to have taken 40 specimens near the Sir Joseph Banks' Group recently in one day. The species was unknown on the local Gulf St. Vincent beaches, dead or alive, until about ten years ago, when odd specimens were taken alive by collectors at Normanville and Outer Harbour.

16. *Drupa margariticola* (Broderip)

Just recently the Secretary of the Malaeological Section, Robert Hall, took a specimen alive at Tumbly Bay. This is the first record of this northern genus in the eastern Flindersian Province.

ECHINODERMATA

17. *Phyllacanthus kimberi* Cotton & Godfrey

In 1942 this distinctive and rare species of sea urchin was described from Port Willunga. It is now obtained occasionally alive.

18. *Adelcidaris tubaria* (Lamarck)

Until about 1942 this species of sea urchin was rare in S.A., but in that year 20 specimens were taken at Normanville in one morning. It is now quite common up to Marino in Gulf St. Vincent.

MANGROVE SWAMPS

Mangrove (*Avicennia officinalis*) swamps once extended at least as far south as Port Noarlunga and flourished for a short period about 3,000 years ago when the climate was warmer. The fauna was wiped out, probably by climatic change, and later silted by fine sand (Cotton, 1949). This is mentioned here as of recent years, since 1948, heavy and encroaching seas have repeatedly exposed the old mangrove swamps and their fauna along the Gulf beaches at such places as Henley, Glenelg and Brighton. Extensive damage to the sea front has been caused.

This violent disturbance has evidently helped to influence populations and distribution of our local fauna.

CONCLUSION

It seems that there has been a noticeable increase and change in marine invertebrate populations during the last twenty years.

Certain Western Australian species are entering the Flindersian Province and flourishing.

Certain local species are increasing in number and extending their range northward into Gulf St. Vincent.

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